

REMARKS

Status of the Application

The application includes claims 3, 7, 9, 10 and 17. In the final Office Action of August 1, 2008, all claims are rejected. With this paper, none of the claims are amended, none are canceled, and none are added.

Claim Rejections under 35 USC §103

Claims 3, 9, 10 and 17 are rejected under 35 U.S.C. §103(a) as being unpatentable over Nishiguchi et al. (JP 09-324096, referred to as Nishiguchi'096 hereinafter) in view of Hirata et al. (JP 2001-316491, referred to as Hirata hereinafter). Claim 7 is rejected under 35 U.S.C. §103(a) as being unpatentable over Nishiguchi'096 in view of Hirata and further in view of Nishiguchi et al. (JP 10-060207). In the rejected claims, only claim 3 is independent.

Claim 3 recites a polyvinyl alcohol film formed from a resin composition. The resin composition comprises: (A) a polyvinyl alcohol resin, (B) an inorganic filler, and (C) a plasticizer, the plasticizer contains trimethylolpropane. Claim 3 further specifies that the polyvinyl alcohol resin (A) comprises two kinds of resins: a first polyvinyl alcohol resin (a1) having a degree of hydrolysis of not less than 55% by mole to less than 82% by mole, and a second polyvinyl alcohol resin (a2) having a degree of hydrolysis of not less than 82% by mole to not more than 99.99% by mole. A ratio of the first polyvinyl alcohol resin (a1) to the second polyvinyl alcohol resin (a2) is from 55/45 to 80/20 by weight, and a difference in degree of hydrolysis between the first polyvinyl alcohol resin (a1) and the second polyvinyl alcohol resin (a2) is at least 3% by mole. The polyvinyl alcohol film of the present invention is further characterized in that it dissolves in water at 20°C within 10 minutes, has an  $\alpha/\beta$  ratio of not more than 10, in which  $\alpha$  is a storage modulus of the film at 20°C in a dry atmosphere and  $\beta$  is a storage modulus of the film at 20°C and 80% RH, and a glass transition temperature of not more than 20°C.

The primary reference Nishiguchi'096 discloses a water-soluble polyvinyl alcohol film. The film is made with a polyvinyl alcohol (PVA) resin composition which comprises a denaturation PVA resin (component A) and a PVA resin (component B). The component A (denaturation PVA) has a degree of saponification (i.e. degree of hydrolysis) of 70-99 mol.%. The weight ratio of the component B to the component A is 95:5-5:95 (Abstract). The component B has a degree of saponification of 70-99 mol.%, preferably 80-95 mol.% (paragraph [0019]). Nishiguchi'096 further teaches that a plasticizer, suitable for the usual PVA film, may be used (paragraph [0026]).

Applicant would like to point out that the **denaturation PVA resin** (component A) is a structurally modified PVA resin (denaturation means molecular structure change) which should not be confused with the normal PVA resin. Nishiguchi'096 describes the denaturation PVA as "PVA having an **anionic group**." The anionic group may be a carboxyl group, a sulfone group, a phosphate group, etc. (paragraph [0013]). The anionic group is introduced into PVA by a so-called post-denaturation process that includes a Michael addition reaction (paragraph [0015]). Nishiguchi'096 further discloses that the PVA resin (component B) is an unmodified PVA resin. Therefore, Nishiguchi'096 is very clear in stating that these two kinds of resins are different in molecular structures, one being modified (having an additional anionic group) and one being unmodified (see Abstract). The amount of the modified PVA resin is at least 5%.

In the present invention (claim 3), the PVA resin (A) is a mixture of a first PVA resin (a1) and a second PVA resin (a2). This composition is not the same as the PVA resin composition (component A + component B) of Nishiguchi'096. Page 6, lines 5-14 of the originally filed application specifies that the PVA resin (A) used in the present invention can be prepared by a know(n) method without any restriction. "That is to say, it can be obtained by **polymerizing** a vinyl ester compound and **hydrolyzing** the resulting vinyl ester polymer." The specification goes on to say that the vinyl ester compound includes various types, and vinyl acetate is suitable from a practical point of view. In other words, the claimed PVA resin (A), which includes a first PVA resin (a1) and a second PVA resin (a2), is prepared by (1) polymerizing and then (2) hydrolyzing. The resulted PVA resin is not a structurally modified

PVA resin having an anionic group, because there is no post-denaturation process (e.g. a Michael addition reaction that introduces an anionic group into the PVA molecular structure) involved in preparing the PVA resin (either in PVA resin (a1) or in PVA resin (a2)).

Applicant respectfully submits that, at the Patent Office, in determining the scope and content of the prior art, the scope of the claimed invention must be clearly determined by giving the claims the "broadest reasonable interpretation consistent with the specification" *Phillips v. AWH Corp.* (Fed. Cir. 2005), and with the broadest reasonable interpretation, "claim language should be read in light of the specification as it would be interpreted by one of ordinary skill in the art" *In re Wheeler* (Fed Cir. 2008). In this application, the claim language regarding the composition of the PVA resin (A), which corresponds to the specification on page 6, lines 5-14, cannot be reasonably interpreted by one of ordinary skill in the art as encompassing a structurally modified PVA resin having an anionic group.

Further, the film of the present invention is characterized in that it has a glass transition temperature ( $T_g$ ) of not more than 20°C, whereas the experiment data in Nishiguchi'096 indicates that the film samples of Nishiguchi'096 must have a glass transition temperature of more than 20°C. This conclusion is based on the observations that: (1) the elongation values of the film samples in Nishiguchi'096 are lower than that of the instant application, and (2) the hygroscopic property of the film samples of Nishiguchi'096 also indicates that the  $T_g$  is not lower than 20°C. The Office is directed to applicant's Declaration under 37 CFR 1.132, filed on July 7, 2006, and response to the final Office Action of September 26, 2006, filed on December 26, 2006. The arguments therein are incorporated by reference. Accordingly, the PVA film of the present invention DOES NOT have a substantially identical polyvinyl alcohol composition as Nishiguchi'096.

Furthermore, Nishiguchi'096 does not disclose an inorganic filler (B) to be included in the polyvinyl alcohol film. As described in the description of this application, a polyvinyl alcohol film formed from a polyvinyl alcohol resin (A) containing 0.1 to 50 parts by weight of an inorganic filler per 100 parts by weight of the polyvinyl alcohol resin has an improved cold water solubility and can prevent blocking of films. Nishiguchi'096 does not explicitly teach this feature.

Even furthermore, as the Office has acknowledged, Nishiguchi'096 does not specifically disclose that the resin composition contains a plasticizer (C) that contains trimethylolpropane (page 3, lines 16-17 of the Detailed Action).

The secondary reference, Hirata, discloses a polyvinyl alcohol based film containing a plasticizer. The plasticizer may be trimethylolpropane (paragraph [0026]). The preferred content of the plasticizer is 1 to 30% by weight in the polyvinyl alcohol film (paragraph [0027]). In combining Nishiguchi'096 and Hirata, the Office states that: **“Both references are analogous art because they are from the same field of endeavor concerning water-soluble film comprises a polyvinyl alcohol and a plasticizer.”** (Page 4, lines 3-4 of the Detailed Action). Applicant respectfully disagrees with the assertion.

Nishiguchi'096, like the present invention, pertains to a polyvinyl alcohol film that is low temperature water soluble for use in water-soluble packaging. Nishiguchi'096 stresses that, in cold water, the film should completely dissolve in a short time. Hirata, on the other hand, pertains to a polyvinyl alcohol film that is suitable for a polarizing film. Hirata emphasizes that the polarizing film must have extremely low water solubility. For example, when 100 cm<sup>2</sup> of such film is left to stand in 1 liter of water of 50°C for 4 hours, the dissolved amount of polyvinyl alcohol is only 1-100 ppm (Abstract).

The polyvinyl alcohol film of Hirata is composed of only one kind of polyvinyl alcohol resin. Hirata teaches the saponification degree of the polyvinyl alcohol resin is preferably more than 97 mol. %, more preferably more than 98 mol. %, still more preferably more than 99 mol. %, and especially most preferably more than 99.5 mol. % (paragraph [0012]). Because the objective of Hirata's invention is to supply a polyvinyl alcohol film for using as a polarizing film, extremely low water solubility of the film is required. The higher the saponification degree of the polyvinyl alcohol resin (closer to 100 mol. %), hence the lower the solubility, the better. Clearly, the Office's assertion that Hirata, like Nishiguchi'096, concerns a water-soluble film comprising a polyvinyl alcohol and a plasticizer is not correct. Nishiguchi'096 and Hirata are clearly not analogous art from the same field of endeavor, and they clearly teach away from each other in physical properties of the films. Nevertheless, because the film composition of Nishiguchi'096 is different from that

of the present invention as stated above (different PVA resin, with or without inorganic filler), a film of Nishiguchi'096 using trimethylolpropane as plasticizer is still not the same as the film of the present invention.

Based on the above reasons, the rejection of claim 3 under 35 USC 103(a) is clearly improper. Therefore, claim 3 is patentable over Nishiguchi'096 in view of Hirata. Withdrawal of the rejection is respectfully requested. Other claims depend directly or indirectly from claim 3. Since claim 3 is patentable, these claims are also patentable at least due to their dependency. Applicant respectfully requests the rejections under 35 USC §103(a) be reconsidered and withdrawn.

**Conclusion**

It is believed that all of the remaining claims in the application are allowable. A decision to withdraw the rejections is respectfully requested.

Date: 1/5/2009

Respectfully submitted,



Shiming Wu  
Agent for the Applicant  
Registration No. 56,885

WARE, FRESSOLA, VAN DER SLUYS  
& ADOLPHSON LLP  
755 Main Street, P.O. Box 224  
Monroe, Connecticut 06468  
Telephone: (203) 261-1234